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10/581,938	03/13/2007	Alexander Biebel	2133.134USU	2163

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OHLANDT, GREELEY, RUGGIERO & PERLE, LLP  
ONE LANDMARK SQUARE, 10TH FLOOR  
STAMFORD, CT 06901

EXAMINER
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HOLLWEG, THOMAS A

ART UNIT	PAPER NUMBER
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2879

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/581,938	<b>Applicant(s)</b> BIEBEL ET AL.	
	<b>Examiner</b> Thomas A. Hollweg	<b>Art Unit</b> 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 23-33 and 36-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-33 and 36-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Acknowledgment of Amendment***

1. The Amendment of March 29, 2010, is acknowledged. Claims 34 and 35 are canceled. Claim 45 is added. Claims 23-33 and 36-45 are currently pending.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 45 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 45 reads "so that an impression of optical depth becomes visible when the laterally structured luminous surface is viewed at right angles". This limitation is not understood for two reasons. First "optical depth", as generally understood in the art, is a measure of how opaque a medium is to radiation passing through it. In other words, it is a measure of transparency. Based on this understanding, the "impression of optical depth" is not understood. Second, it is not understood how "the laterally structured luminous surface is viewed at right angles". This would seem to mean that the laterally structured luminous surface is viewed from a position that is perpendicular to the plane of the luminous surface. However, in the claim the "angles" are plural, indicating multiple positions of viewing. Therefore, the position of viewing is not ascertainable.

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5. Also, this limitation seems to define a method for operating the device rather than further defining the structure of the device. Therefore, for examination it is treated as not further limiting the claimed structure.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**7. Claims 23-28, 36, 37 and 39-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al., U.S. Patent No. 6,326,224 B1 in view of Jacobsen et al., U.S. Patent Application Publication No. 2001/0005114 A1.**

8. **With regard to claim 23**, in figure 2, Xu discloses a display device (30) comprising: a luminous element (31); a laterally structured luminous surface (38) having at least one region that is capable of illumination; and a transparent substrate (45) having a light-reflecting layer (41, 46) on each side of the transparent substrate (45) at a first distance from one another, the transparent substrate (45) being arranged so that one of the light-reflecting layers (41) is opposite the laterally structured luminous surface (38), wherein light emitted by the laterally structured luminous surface (38) is reflected along a beam path back and forth between the light-reflecting layers (41, 46), and wherein at least one of the light-reflecting layers (41, 46) is semitransparent and at least one of the light-reflecting layers (46) is arranged at a second distance from the luminous element (31) (col. 3, line 41 - col. 4, line 20).

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9. Xu does not expressly disclose that the light-reflecting layers are arranged obliquely with respect to one another.

10. Jacobsen, in figures 4 and 5, teaches a microcavity resonator, like the one employed in the Xu device, with different designs [0019, 0028] including where the light-reflecting layers are arranged obliquely with respect to one another (fig. 5) so that the design of the microcavity resonator may be adjusted to optimize display performance [0074-0076].

11. Therefore, at the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Xu microcavity where the light-reflecting layers are arranged obliquely with respect to one another, to optimize the performance of the display.

12. **With regard to claim 24**, in figure 2, Xu discloses that at least one of the light-reflecting layers (41, 46) comprises an interference reflection layer (col. 3, lines 15-24).

13. **With regard to claim 25**, in figure 2, Xu discloses that the interference reflection layer (41, 46) comprises alternating layers with a high refractive index and a low refractive index, the alternating layers with the high refractive index comprising a first material selected from the group consisting of niobium oxide, tantalum oxide, and titanium oxide, and the alternating layers with the low refractive index comprising a second material selected from the group consisting of aluminum oxide, hafnium oxide, silicon oxide, and magnesium fluoride (col. 3, lines 15-24).

14. **With regard to claim 26**, in figure 2, Xu discloses that at least one of the light-reflecting layers (41, 46) comprises a metallic reflection layer (col. 3, line 22).

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15. **With regard to claim 27**, the Examiner notes that the claim limitation “a dip coating, a spin coating, a sputtered coating, a PVD coating, a CVD coating, a PECVD coating, and a PICVD coating” is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation has been considered, but not patentably distinct over Xu (see MPEP 2113).

16. **With regard to claim 28**, in figure 2, Xu discloses that the luminous element comprises an OLED (col. 3, lines 48-50).

17. **With regard to claim 36**, Jacobsen, in figure 5, teaches a microcavity resonator where at least one of the light-reflecting layers is curved [0074-0076].

18. **With regard to claim 37**, in figure 2, Xu discloses a partially absorbing material (45) arranged in the beam path between the light-reflection layers (41, 46) (col. 4, lines 3-5) (no real material will be 100% transparent).

19. **With regard to claim 39**, in figure 2, Xu discloses that the at least one light-reflecting layers (41, 46) has a transmittance that varies spectrally in a wavelength region of the light emitted by the luminous element (31) (transmittance of interference reflection layers inherently varies with wavelength).

20. **With regard to claim 40**, in figure 2, Xu discloses that the at least one light-reflecting layers (41, 46) has a transmittance that varies spectrally as a function of an

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angle of incidence of the light emitted by the luminous element (31) (transmittance of interference reflection layers inherently varies with angle).

21. **With regard to claim 41**, Xu and Jacobsen disclose all of the limitations, but they are silent as to whether all of the components are permanently fixed or may be displaceably arranged.

22. One having ordinary skill in the art would understand that any of the components, including the light-reflecting layers may be arranged so that they may be adjusted for fine tuning of the device.

23. Therefore, at the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Xu and Jacobsen device where at least one of the light-reflecting layers is displaceably arranged relative to the other light-reflecting layer, so that the device may be finely tuned.

24. **With regard to claim 42**, Xu and Jacobsen discloses all of the limitations, but they are silent as to whether all of the components are permanently fixed or may be displaceably arranged.

25. One having ordinary skill in the art would understand that any of the components, including the light-reflecting layers may be arranged so that they may be adjusted for fine tuning of the device.

26. Therefore, at the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Xu and Jacobsen device where one of the light-reflecting layers is applied to the transparent substrate, and wherein the

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transparent substrate can be displaced or positioned with respect to the other of the light-reflecting layers, so that the device may be finely tuned.

27. **With regard to claim 43**, in figure 2, Xu discloses a third light-reflecting layer (35) spaced apart from the light-reflecting layers (col. 3, lines 60-61).

28. **With regard to claim 44**, in figure 2, Xu discloses that the display device is configured for use as an information display selected from the group consisting of a motor vehicle, a telecommunications device, a mobile telephone, a domestic appliance, toy, an advertising, a warning or information board, an emblem, and a logo (col. 1, lines 27-31).

29. **Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu and Jacobsen as applied to claim 28 above, and further in view of Hanawa et al., U.S. Patent Application Publication No. 2004/0021414 A1.**

30. **With regard to claim 29**, Xu and Jacobsen disclose all of the limitations, but they do not expressly disclose that the OLED comprises an electrode layer that forms one of the light-reflecting layers.

31. Hanawa, in figure 1, teaches an OLED (10) where an electrode layer (16) forms one of the light-reflecting layers [0028], so that the OLED device with reflecting layers is simpler to manufacture.

32. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Xu and Jacobsen device where the OLED comprises an electrode layer that forms one of the light-reflecting layers, as taught by Hanawa, so that the device is simpler to manufacture.



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33. **With regard to claim 30**, in figure 1, Hanawa teaches that the electrode layer (16) comprises transparent conductive oxide (16B) and a semitransparent thin metal layer (16A) [0028].

34. **With regard to claim 31**, in figure 2, Xu and Jacobsen disclose that the OLED comprises two electrode layers (35, 38) (col. 3, lines 49-55). However Xu and Jacobsen do not expressly disclose a laterally structured insulation layer that covers at least a region of one of the two electrode layers and is arranged between the two electrode layers.

35. Hanawa, in figure 1, discloses an OLED with two electrodes (16, 12) with a laterally structured insulation layer 12 that covers at least a region of one of the two electrode layers and is arranged between the two electrode layers [0021] to separate the pixels of the display.

36. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Xu and Jacobsen device having a laterally structured insulation layer that covers at least a region of one of the two electrode layers and is arranged between the two electrode layers, as taught by Hanawa, to separate the pixels of the display.

37. **With regard to claim 32**, in figure 2, Xu discloses that at least one of the two electrode layers (35, 38) is laterally structured (col. 3, lines 49-55).

38. **Claims 33 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu and Jacobsen as applied to claims 23 and 37 above, and further in view of Eida et al., U.S. Patent No. 6,344,712 B1.**

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39. **With regard to claim 33**, Xu and Jacobsen disclose all of the limitations, except they do not expressly disclose a laterally structured mask.

40. Eida, in figure 1, teaches an OLED display having a laterally structured mask (21), to improve the contrast of the display (col. 5, lines 2-4).

41. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Xu and Jacobsen device having a laterally structured mask, as taught by Eida, to improve the contrast of the display.

42. **With regard to claim 38**, Xu and Jacobsen disclose all of the limitations, except they do not expressly disclose that the partially absorbing material comprises a colored material.

43. Eida, in figure 1, teaches an OLED display having a colored material (22) in the path of the emitted light to purify the color of the emitted light (col. 3, lines 9-14; col. 11, lines 21-23).

44. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Xu and Jacobsen device where the partially absorbing material comprises a colored material, to further purify the color of the emitted light.

**45. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xu, in view of Noda et al., U.S. Patent Application Publication No. 2003/0005114 A1.**

46. **With regard to claim 45**, in figure 2, Xu discloses a display device (30) comprising: a laterally structured luminous surface (38) having at least one region that is capable of emitting light; a first light-reflecting layer (41) opposite the laterally structured luminous surface (38); a transparent substrate (45) having the first light-reflecting layer

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(41) on a first side thereof; and a second light-reflecting layer (46) on a second side of the transparent substrate (45) (col. 3, line 41 - col. 4, line 20).

47. Xu does not expressly disclose that the second light-reflecting layer is arranged on the transparent substrate obliquely with respect to the first light-reflecting layer.

48. Noda, in figure 3, teaches a microcavity light device having two opposing reflective layers, (D) and (HM), for purifying color emission [0006], where the second light-reflecting layer (HM) is arranged obliquely with respect to the first light-reflecting layer (D), so that the incident light and the emitted light can travel in the same direction (see figure 3) [0057-0059].

49. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Xu device where the second light-reflecting layer is arranged on the transparent substrate obliquely with respect to the first light-reflecting layer, as taught by Noda, so that the incident light and the emitted light can travel in the same direction.

### ***Response to Arguments***

50. Applicant argues that the above rejections are not valid because the prior art of record does not disclose or teach that "the light reflecting layers are arranged obliquely with respect to one another". Applicant states that the prior art reference Xu requires that a plurality of microcavities 32 and 34 are positioned **in tandem** with the light output from diode 31 to successively purify the light spectrum. Applicant concludes that this supposed "in tandem" requirement teaches away from the modification proposed. The examiner respectfully disagrees.

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51. A close reading reveals that Xu teaches that multiple microcavities may be configured to operate in tandem. This feature is an option of Xu, not a requirement. Also, Applicant does not specify, and Xu does not suggest why one or more of the microcavities in the Xu device cannot be modified with the features of Jacobsen, as suggested in the above rejection. Jacobsen teaches alternate configurations for microcavities, none of which are incompatible with the Xu device.

52. Applicant also argues that the microcavities taught by Jacobsen are governed by quantum electrodynamic theory (QED). QED theory is essentially the basis for understanding the interactions between light and matter. Jacobsen, Xu and Applicant's device are all governed by this theory.

53. Lastly, Applicant argues that Jacobsen does not disclose that the light reflecting layers are obliquely arranged, but rather the Jacobsen light reflecting layers are arranged in parallel. Figure 5 of Jacobsen expressly shows a microcavity having two curved reflective layers that are arranged obliquely. Specifically, they are configured in a confocal mirror design (see Jacobsen [0075]). This is one of many configurations taught by Jacobsen ([0019, 0028] teaching planar, three-dimensional, confocal, hemispherical and ring microcavities). It is noted that the claim term "arranged obliquely" (from claim 23) includes reflective layers which are curved (from claim 36, dependent on claim 23). Therefore, the confocal mirror design of Jacobsen's figure 5 shows two reflective layers arranged obliquely. For these reasons applicant's arguments are not found to be convincing.

***Conclusion***

54. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

55. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

56. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas A. Hollweg whose telephone number is (571) 270-1739. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm E.S.T..

57. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

58. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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/TH/

/NIMESHKUMAR D. PATEL/  
Supervisory Patent Examiner, Art Unit 2879